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XVI. *On the Reduction of the Thermometrical Observations made at the Apartments of the Royal Society, from the years* 1774 *to* 1781, *and from the years* 1787 *to* 1843.

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Received February 21,—Read May 3, 1849.

THE meteorological observations which have been made at the Apartments of this Society, extend over so long a period of time, that if the instruments used have been good, and the observations have been faithfully recorded, the results which can be deduced from them must be of great value; on the other hand, if either of these essentials has been neglected, any results from them would be valueless.

To the present time, so much uncertainty seems to have rested upon these observations, and so much suspicion upon their accuracy, that they have been little used, and generally when reference has been made to them, it has been accompanied with the remark that the results were not satisfactory, and till recently such was the opinion which I entertained myself.

In the year 1848 I had the honour of presenting to this Society the determination of the diurnal variations of the different meteorological elements, and the corrections to be applied to monthly mean values of observations taken at any time of the day, to deduce from them the true values for the month.

The accordance which I had found in the diurnal variations year by year, led me to suspect that the corrections would apply to a great number of years. To determine this I had recourse to the observations of this Society. Throughout this series two thermometers have been used in the ordinary daily observations; each was placed 2 or 3 inches from a wall, one facing E.N.E. and the other W.S.W. As the sun shines on the eastern part of the building in the morning, the thermometer to the westward was made use of for the morning observation during that season of the year when the sun rose high enough to affect the other: for all other observations, that to the eastward was employed. Of these instruments two observations have been taken daily, the one before and the other after noon; the actual times, however, have been different at different epochs, and at times different in the same month; these circumstances were favourable for my purpose, though undoubtedly they have been highly prejudicial to the character of the journal in consequence of the diurnal variations being then unknown, and the mean monthly values as printed differing from the true values for the month by different quantities.

At every variation of the times of observation, and at different epochs with the same times, I determined two mean values, the one from the morning observations, and the other from the afternoon observations, and compared the difference between them, with the difference as exhibited in my tables; in nearly all cases the values thus found were nearly alike; hence it appeared that the corrections apply equally well to all the years since 1774.

Having ascertained this fact, I felt I had the means, to a certain extent, of determining the quality of the instruments which have been used, as, for the most part, different instruments were used in the morning and in the afternoon observations, and also the correctness of the observations generally; and thus the means of ascertaining the value of the results which could be deduced from them.

I need not mention all the tests to which I have subjected the observations, but briefly state that the results were, a conviction on my mind that the instruments had been uniformly good, that the observations had been faithfully recorded as read from the instruments, and that very great care had been taken in reading at the times stated; the latter circumstance was most satisfactorily proved from the fact of the results being the same when the times of observation have been such that the changes were rapid, and consequently a small error in the time of reading would have entailed a considerable error in the results.

I found however that during the time the maximum and minimum thermometers were in use, their readings were frequently in defect or excess respectively as compared with those of the other thermometers made during the day, and this was found to be more frequently the case in the later than in the earlier observations. On examining farther and bearing in mind that a self-registering thermometer, whose reading is taken once a day only, merely registers the extreme reading which has taken place in the preceding twenty-four hours, many of the apparent discrepancies vanished, yet still some remain for which I cannot account. I know it has been said that at times the sun has shone upon, or its reflected rays have impinged upon the maximum thermometer; but, if this has been the case, I feel certain that it was of rare occurrence, and therefore it is not sufficient alone to warrant us in rejecting a long series of observations: possibly no journal of the weather has been kept for any length of time, where an attempt has been made to have the instruments properly exposed, that such accidents have not happened.

There being thus three independent methods of determining the mean temperature of the air, viz. first, from the morning observations by one thermometer; secondly, from the afternoon observations by another thermometer; and thirdly, from the observations made by the maximum and minimum thermometers, I had every means of ascertaining whether the one or the other of these methods was bad. Having satisfied myself that the observations were well worth any amount of labour bestowed upon them, I became anxious to reduce them to a useful and accessible form; but the amount of work required to reduce observations extending from the year 1774 to 1843, with the exception of five years, from 1781 to 1786, during which interval no observations were made, was so great, that, unassisted, I hesitated to begin the reductions, although the results, as printed in the Philosophical Transactions, are unfit for application to useful purposes, there having been a departure in the observations themselves, from an absolutely necessary condition, viz. that of taking the observations at stated times, when the diurnal variations were unknown.

About two months after this, WILLIAM FARR, Esq., who is at the head of the Statistical Department in the office of the Registrar-General, wished me to supply the meteorological particulars of as many years as could be given with certainty, to accompany statistical tables upon which he is engaged. Finding therefore that the demand for the results from trustworthy observations, extending backwards many years, was increasing, with the knowledge that such could be deduced from the observations of this Society, together with the hope of connecting the Greenwich series of observations with these, I readily undertook to perform the work.

I have now the honour of presenting to the Society the results from all the Thermometrical Observations which have been taken at Somerset House. I have chosen these in preference to the Barometrical, as being at present more important, and more immediately useful. The prevalence of epidemic complaints renders it desirable to compare the simultaneous meteorological conditions with those, when no particular disease prevailed. The cholera epidemic now prevalent has caused me to prepare this paper as quickly as possible.

I shall now proceed to explain the manner in which the annexed Tables were formed.

Table I. was made by applying the corrections to the mean of the observations made during every month, according to the times of the day at which they had been taken, and thus determining, from the observations taken during the day, one mean temperature for the month, which has been used as the true mean at all times when the self-registering thermometers have not been used; at times when they were in use a second mean has been found by applying the corrections as mentioned in my paper in the Philosophical Transactions in 1848. Thus two values of the same element have for the most part been found monthly; the difference between these results in most cases was a quantity less than a degree. As both determinations rested upon two observed readings daily, I considered them entitled to equal weight, and in most cases I have taken a simple arithmetical mean between them, which I have adopted as the true mean for the month. From the accordance thus found by these two methods, I inferred that either could be used with safety at times when both sets of instruments were not in use.

TABLE I.—Showing the mean temperature of each month, as deduced from the corrected mean of the two observations of the thermometer daily, and the corrected mean as found from the maximum and minimum self-registering thermometers, made at Somerset House during the years 1774 to 1781, and from 1787 to 1843.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1774.	33°·1	39°·4	43°·9	47°·9	52°·2	61°·0	62°·8	61°·5	55°·8	50°·1	40°·5	38°·5
1775.	42·0	43·3	42·8	50·8	55·2	63·5	64·0	62·1	59·5	49·5	41·5	40·7
1776.	28·6	41·4	44·8	48·3	51·7	59·6	63·8	62·0	55·6	52·8	44·0	41·5
1777.	35·5	37·2	45·7	45·1	53·4	57·2	61·5	63·7	59·2	52·6	45·0	37·2
1778.	36·4	37·0	41·2	48·0	55·9	62·2	68·0	64·8	54·5	47·3	46·0	44·2
1779.	36·4	46·7	48·1	51·8	55·8	58·9	65·9	65·2	61·8	53·2	43·2	41·6
1780.	30·2	36·7	50·3	44·7	57·2	60·0	64·2	67·0	60·4	51·3	40·8	38·0
1781.	37·8	41·7	43·7	47·2	54·2	63·4	66·3	64·3				
1787.	38·3	40·9	43·9	45·5	52·4	58·7	62·4	62·4	55·5	49·9	40·9	41·0
1788.	39·0	40·1	39·7	50·6	57·4	59·5	61·6	61·2	57·0	50·4	41·9	30·4
1789.	35·0	41·3	35·5	45·2	54·3	55·7	59·8	61·5	55·7	48·1	40·0	43·0
1790.	40·2	42·6	44·3	42·0	53·7	57·7	60·1	61·2	55·0	50·8	43·3	40·4
1791.	41·4	40·2	43·2	49·9	50·5	58·5	60·5	62·7	57·9	47·9	42·6	36·2
1792.	36·5	38·8	43·2	50·0	50·7	55·3	59·6	63·5	56·5	50·0	44·5	41·4
1793.	36·9	41·1	40·4	43·5	51·8	56·3	65·9	60·3	53·9	53·2	44·2	42·4
1794.	34·9	46·1	45·4	50·7	51·7	58·5	66·3	60·7	54·8	49·6	44·6	38·2
1795.	25·5	35·5	39·7	46·2	53·0	54·6	59·9	62·1	61·9	54·7	42·0	46·2
1796.	46·9	41·0	40·1	49·4	51·2	57·0	59·6	61·2	60·2	47·8	41·6	31·8
1797.	37·0	37·0	39·0	45·8	52·4	55·7	64·3	60·3	55·7	48·3	42·7	42·6
1798.	39·4	39·3	41·8	50·3	54·7	62·1	62·2	62·8	57·6	51·1	41·3	35·1
1799.	34·9	37·8	38·3	42·6	50·6	56·5	60·8	58·8	55·4	48·6	44·2	34·2
1800.	38·5	35·5	38·6	49·5	55·1	56·0	64·2	65·0	59·0	49·2	43·5	39·6
1801.	41·1	39·9	45·2	46·5	54·7	59·3	61·5	63·8	59·8	52·2	41·5	37·5
1802.	34·5	40·3	42·3	49·6	51·3	58·5	57·5	66·1	58·1	45·8	41·8	39·2
1803.	35·0	37·7	43·4	48·9	51·2	57·1	64·7	63·0	53·5	50·2	43·2	44·7
1804.	44·8	38·3	42·2	44·8	57·7	62·2	61·2	61·2	60·5	52·7	45·4	37·0
1805.	36·1	40·1	43·1	46·4	50·7	55·4	60·1	63·0	60·4	48·7	41·2	40·9
1806.	42·2	42·9	41·8	44·1	56·1	60·7	62·2	62·7	58·1	52·5	48·7	48·2
1807.	38·3	41·4	38·1	46·5	56·1	58·6	64·5	65·0	54·2	54·3	40·0	38·0
1808.	38·6	37·7	38·2	43·6	58·2	58·9	66·7	63·8	56·4	47·4	45·2	37·4
1809.	32·0	45·5	43·7	42·2	56·8	58·4	60·6	60·2	57·2	50·9	40·8	42·4
1810.	36·0	40·0	43·3	47·5	50·8	59·4	61·9	61·8	60·5	53·1	44·1	40·0
1811.	34·3	41·3	44·0	49·0	56·4	58·0	61·0	58·9	58·3	56·3	46·3	39·8
1812.	37·5	43·0	39·5	42·6	52·3	54·9	58·4	58·3	57·0	50·1	41·9	36·5
1813.	36·0	43·0	44·2	44·9	53·4	56·2	59·9	59·6	55·6	48·6	41·5	38·0
1814.	28·5	35·4	36·2	49·2	49·7	54·3	62·1	59·9	56·0	48·6	42·0	42·5
1815.	33·5	42·6	46·1	47·7	55·8	58·9	60·9	61·7	63·4	52·7	40·2	38·4
1816.	38·3	38·0	40·3	44·5	49·9	54·0	55·5	59·2	60·0	52·1	40·6	39·2
1817.	40·8	44·0	42·7	45·0	49·0	60·0	58·7	56·7	56·6	46·3	48·2	38·5
1818.	40·9	37·2	42·0	46·7	53·6	63·8	67·2	64·9	61·8	55·0	50·5	40·2
1819.	41·7	41·4	45·1	49·3	55·3	57·3	62·7	65·1	59·2	48·8	42·1	38·4
1820.	33·3	38·3	42·4	50·4	53·1	57·0	60·5	59·8	55·5	48·3	42·7	41·3
1821.	39·1	37·4	43·9	51·5	50·5	55·0	58·7	63·0	60·7	51·6	48·9	45·7
1822.	41·4	44·7	48·4	47·8	56·9	63·5	63·5	62·6	57·1	53·3	49·5	37·8
1823.	33·4	39·5	40·9	43·9	55·7	56·3	60·1	61·1	56·5	48·9	44·3	41·3
1824.	39·0	37·6	40·6	44·9	50·6	55·9	63·5	61·3	58·8	51·1	47·5	43·2
1825.	40·0	39·5	39·6	49·8	54·7	59·8	66·2	63·1	61·0	52·1	42·5	42·0
1826.	33·6	43·6	44·3	50·1	51·1	63·8	66·6	64·7	57·4	53·7	41·2	43·2
1827.	35·0	33·0	44·2	47·9	53·8	58·5	64·5	60·3	58·0	53·1	42·8	45·5
1828.	41·4	41·6	44·6	47·6	55·4	60·9	62·9	60·3	58·6	51·2	45·6	45·9
1829.	33·3	39·8	40·1	44·8	55·6	59·9	61·1	59·0	54·3	48·8	40·6	36·3
1830.	32·3	35·6	46·9	49·4	55·8	56·2	64·0	59·5	54·6	52·2	45·7	36·3
1831.	36·0	42·6	45·0	49·2	53·9	60·3	65·3	64·6	57·5	56·3	45·6	43·4
1832.	38·9	38·3	41·6	48·3	52·6	60·1	62·2	62·3	57·7	52·5	45·0	43·8
1833.	36·1	43·8	38·7	46·3	60·5	60·7	62·1	58·8	54·6	49·6	44·8	46·0
1834.	46·0	41·6	45·1	46·1	53·0	62·0	65·1	63·6	59·4	51·8	45·4	42·4
1835.	39·6	42·6	42·1	47·5	54·0	60·9	65·4	64·6	58·2	49·3	44·3	36·3
1836.	38·8	38·3	44·8	44·4	53·9	59·9	63·9	60·2	54·5	48·7	42·8	41·0
1837.	38·8	41·7	36·9	40·2	48·9	59·0	62·3	61·4	56·1	51·9	42·4	42·6
1838.	30·5	34·3	42·6	42·7	51·8	58·1	61·5	60·9	55·5	51·3	42·1	40·0
1839.	38·8	40·5	40·1	42·0	51·0	59·6	61·2	60·2	56·7	50·2	46·0	41·0
1840.	40·6	39·5	38·7	48·9	54·6	55·2	59·0	63·4	55·2	48·1	44·7	34·7
1841.	36·1	36·6	47·9	47·4	57·9	57·2	59·0	61·3	58·5	50·7	44·5	42·0
1842.	34·8	42·2	45·4	45·7	54·3	64·2	61·5	66·6	57·5	47·2	44·2	45·3
1843.	41·3	37·5	43·6	48·6	52·8	56·4						

By taking the means of the numbers in this table in different groups of years the next Table is formed.

Table II.—Showing the mean temperature of the Air in each month in successive groups of years.

Period.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
From 1774 to 1781	35°·0	40°·4	45°·1	48°·0	54°·4	60°·7	64°·4	63°·8	58°·1	51°·0	43°·0	40°·2
From 1787 to 1796	37·5	40·8	41·5	47·3	52·7	57·2	61·6	61·7	56·8	50·2	42·5	39·1
From 1797 to 1806	38·4	38·9	41·6	46·9	53·4	58·4	61·9	62·7	57·8	49·9	43·3	39·9
From 1807 to 1816	35·4	40·1	41·4	45·8	52·8	57·2	61·2	60·8	57·6	51·4	42·3	40·2
From 1817 to 1826	38·6	40·3	43·0	47·9	53·1	59·2	62·7	62·2	58·5	50·9	45·7	41·1
From 1827 to 1836	37·7	39·7	43·3	47·2	54·8	59·9	63·6	61·3	56·7	51·4	44·2	41·5
From 1837 to 1843	37·7	38·9	42·1	45·1	53·1	58·2	60·9	62·3	56·6	49·9	44·6	40·9

The mean temperature of January from all the observations is . . . 37°·2
The mean temperature of February from all the observations is . . 40·1
The mean temperature of March from all the observations is . . . 42·5
The mean temperature of April from all the observations is . . . 46·9
The mean temperature of May from all the observations is . . . . 53·5
The mean temperature of June from all the observations is. . . . 58·7
The mean temperature of July from all the observations is . . . . 62·4
The mean temperature of August from all the observations is . . . 62·1
The mean temperature of September from all the observations is . . 57·5
The mean temperature of October from all the observations is . . 50·7
The mean temperature of November from all the observations is . . 44·0
The mean temperature of December from all the observations is . . 40·4
The mean of all the monthly results is . . . . 49·7

I shall not attempt to enter into the discussion of periods of less or greater heat, as such can be very readily seen in the following Table, which is formed by taking the difference between the mean temperature of the month derived from all the observations, and the mean temperature of the same month in every year, as contained in Table I.

Table III.—Showing the excess of the monthly mean temperature, in every year, above the mean temperature of the month, as deduced from all the years.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1774.	−4°·1	−0°·7	+1°·4	+1°·0	−1°·3	+2°·3	+0°·4	−0°·6	−1°·7	−0°·6	−3°·5	−1°·9
1775.	+4·8	+3·2	+0·3	+3·9	+1·7	+4·8	+1·6	0·0	+2·0	−1·2	−2·5	+0·3
1776.	−8·6	+1·3	+2·3	+1·4	−1·8	+0·9	+1·4	−0·1	−1·9	+2·1	0·0	+1·1
1777.	−1·7	−2·9	+3·2	−1·8	−0·1	−1·5	−0·9	+1·6	+1·7	+1·9	+1·0	−3·2
1778.	−0·8	−3·1	−1·3	+1·1	+2·4	+3·5	+5·6	+2·7	−3·0	−3·4	+2·0	+3·8
1779.	−0·8	+6·6	+5·6	+4·9	+2·3	+0·2	+3·5	+3·1	+4·3	+2·5	−0·8	+1·2
1780.	−7·0	−3·4	+7·8	−2·2	+3·7	+1·3	+1·8	+4·9	+2·9	+0·6	−3·2	−2·4
1781.	+0·6	+1·6	+1·2	+0·3	+0·7	+4·7	+3·9	+2·2				
1787.	+1·1	+0·8	+1·4	−1·4	−1·1	0·0	0·0	+0·3	−2·0	−0·8	−3·1	+0·6
1788.	+1·8	0·0	−2·8	+3·7	+3·9	+0·8	−0·8	−0·9	−0·5	−0·3	−2·1	−10·0
1789.	−2·2	+1·2	−7·0	−1·7	+0·8	−3·0	−2·6	−0·6	−1·8	−2·6	−4·0	+2·6
1790.	+3·0	+2·5	+1·8	−4·9	+0·2	−1·0	−2·3	−0·9	−2·5	+0·1	−0·7	0·0
1791.	+4·2	+0·1	+0·7	+3·0	−3·0	−0·2	−1·9	+0·6	+0·4	−2·8	−1·4	−4·2
1792.	−0·7	−1·3	+0·7	+3·1	−2·8	−3·4	−2·8	+1·4	−1·0	−0·7	+0·5	+1·0
1793.	−0·3	+1·0	−2·1	−3·4	−1·7	−2·4	+3·5	−1·8	−3·6	+2·5	+0·2	+2·0
1794.	−2·3	+6·0	+2·9	+3·8	−1·8	−0·2	+3·9	−1·4	−2·7	−1·1	+0·6	−2·2
1795.	−11·7	−4·6	−2·8	−0·7	−0·5	−4·1	−2·5	0·0	+4·4	+4·0	−2·0	+5·8
1796.	+9·7	+0·9	−2·4	+2·5	−2·3	−1·7	−2·8	−0·9	+2·7	−2·9	−2·4	−8·6
1797.	−0·2	−3·1	−3·5	−1·1	−1·1	−3·0	+1·9	−1·8	−1·8	−2·4	−1·3	+2·2
1798.	+2·2	−0·8	−0·7	+3·4	+1·2	+3·4	−0·2	+0·7	+0·1	+0·4	−2·7	−5·3
1799.	−2·3	−2·3	−4·2	−4·3	−2·9	−2·2	−1·6	−3·3	−2·1	−2·1	+0·2	−6·2
1800.	+1·3	−4·6	−3·9	+2·6	+1·6	−2·7	+1·8	+2·9	+1·5	−1·5	−0·5	−0·8
1801.	+3·9	−0·2	+2·7	−0·4	+1·2	+0·6	−0·9	+1·7	+2·3	+1·5	−2·5	−2·9
1802.	−2·7	+0·2	−0·2	+2·7	−2·2	−0·2	−4·9	+4·0	+0·6	−4·9	−2·2	−1·2
1803.	−2·2	−2·4	+0·9	+2·0	−2·3	−1·6	+2·3	+0·9	−3·7	−0·5	−0·8	+4·3
1804.	+7·6	−1·8	−0·3	−2·1	+4·2	+3·5	−1·2	−0·9	+3·0	+2·0	+1·4	−3·4
1805.	−1·1	0·0	+0·6	−0·5	−2·8	−3·3	−2·3	+0·9	+2·9	−2·0	−2·8	+0·5
1806.	+5·0	+2·8	−0·7	−2·8	+2·6	+2·0	−0·2	+0·6	+0·6	+1·8	+4·7	+7·8
1807.	+1·1	+1·3	−4·4	−0·4	+2·6	−0·1	+2·1	+2·9	−3·3	+3·6	−4·0	−2·4
1808.	+1·4	−2·4	−4·3	−3·3	+4·7	+0·2	+4·3	+1·7	−1·1	−3·3	+1·2	−3·0
1809.	−5·2	+5·4	+1·2	−4·7	+3·3	−0·3	−1·8	−1·9	−0·3	+0·2	−3·2	+2·0
1810.	−1·2	−0·1	+0·8	+0·6	−2·7	+0·7	−0·5	−0·3	+3·0	+2·4	+0·1	−0·4
1811.	−2·9	+1·2	+1·5	+2·1	+2·9	−0·7	−1·4	−3·2	+0·8	+5·6	+2·3	−0·6
1812.	+0·3	+2·9	−3·0	−4·3	−1·2	−3·8	−4·4	−3·8	−0·5	−0·6	−2·1	−3·9
1813.	−1·2	+2·9	+1·7	−2·0	−0·1	−2·5	−2·5	−2·5	−1·9	−2·1	−2·5	−2·4
1814.	−8·7	−4·7	−6·3	+2·3	−3·8	−4·4	−0·3	−2·2	−1·5	−2·1	−2·0	+2·1
1815.	−3·7	+2·5	+3·6	+0·8	+2·3	+0·2	−1·5	−0·4	+5·9	+2·0	−3·8	−2·0
1816.	+1·1	−2·1	−2·2	−2·4	−3·6	−4·7	−6·9	−2·9	+2·5	+1·4	−3·4	−1·2
1817.	+3·6	+3·9	−0·2	−1·9	−4·5	+1·3	−3·7	−5·4	−0·9	−4·4	+4·2	−1·9
1818.	+3·7	−2·9	−0·5	−0·2	+0·1	+5·1	+4·8	+2·8	+4·3	+4·3	+6·5	−0·2
1819.	+4·5	+1·3	+2·6	+2·4	+1·8	−4·4	+0·3	+3·0	+1·7	−1·9	−1·9	−2·0
1820.	−3·9	−1·8	−0·1	+3·5	−0·4	−1·7	−1·9	−2·3	−2·0	−2·4	−1·3	+0·9
1821.	+1·9	−2·7	+1·4	+4·6	−3·0	−3·7	−3·7	+0·9	+3·2	+0·9	+4·9	+5·3
1822.	+4·2	+4·6	+5·9	+0·9	+3·4	+4·8	+1·1	+0·5	−0·4	+2·6	+5·5	−2·6
1823.	+3·8	−0·6	−1·6	−3·0	+2·2	−2·4	−2·3	−1·0	−1·0	−1·8	+0·3	+0·9
1824.	+1·8	−2·5	−1·9	−2·0	−2·9	−2·8	+1·1	−0·8	+1·3	+0·4	+3·5	+2·8
1825.	+2·8	−0·6	−2·9	+2·9	+1·2	+1·1	+3·8	+1·0	+3·5	+1·4	−1·5	+1·6
1826.	−3·6	+3·5	+1·8	+3·2	−2·4	+5·1	+4·2	+2·6	−0·1	+3·0	−2·8	+2·8
1827.	−2·2	−7·1	+1·7	+1·0	+0·3	−0·2	+2·1	−1·8	+0·5	+2·4	−1·2	+5·1
1828.	+4·2	+1·5	+2·1	+0·7	+1·9	+2·2	+0·5	−1·8	+1·1	+0·5	+1·6	+5·5
1829.	−3·9	−0·3	−2·4	−2·1	+2·1	+1·2	−1·3	−3·1	−3·2	−1·9	−3·4	−4·1
1830.	−4·9	−4·5	+4·4	+2·5	+2·3	−2·5	+1·6	−2·6	−2·9	+1·5	+1·7	−4·1
1831.	−1·2	+2·5	+2·5	+2·3	+0·4	+1·6	+2·9	+2·5	0·0	+5·6	+1·6	+3·0
1832.	+1·7	−1·8	−0·9	+1·4	−0·9	+1·4	−0·2	+0·2	+0·2	+1·8	+1·0	+3·4
1833.	−1·1	+3·7	−3·8	−0·6	+7·0	+2·0	−0·3	−3·3	−2·9	−1·1	+0·8	+5·6
1834.	+8·8	+1·5	+2·6	−0·8	−0·5	+3·3	+2·7	+1·5	+1·9	+1·1	+1·4	+2·0
1835.	+2·4	+2·5	−0·4	+0·6	+0·5	+2·2	+3·0	+2·5	+0·7	−1·4	+0·3	−4·1
1836.	+1·6	−1·8	+2·3	−2·5	+0·4	+1·2	+1·5	−1·9	−3·0	−2·0	−1·2	+0·6
1837.	+1·6	+1·6	−5·6	−6·7	−4·6	+0·3	−0·1	−0·7	−1·4	+1·2	−1·6	+2·2
1838.	−6·7	−5·8	+0·1	−4·2	−1·7	−0·6	−0·9	−1·2	−2·0	+0·6	−1·9	−0·4
1839.	+1·6	+0·4	−2·4	−4·9	−2·5	+0·9	−1·2	−1·9	−0·8	−0·5	+2·0	+0·6
1840.	+3·4	−0·6	−3·8	+2·0	+1·1	−3·5	−2·6	+1·3	−2·3	−2·6	+0·7	−5·7
1841.	−1·1	−3·5	+5·4	+0·5	+4·4	−1·5	−3·4	−0·8	+1·0	0·0	+0·5	+1·6
1842.	−2·4	+2·1	+2·9	−1·2	+0·8	+5·5	−0·9	+4·5	0·0	−3·5	+0·2	+4·9
1843.	+4·1	−2·6	+1·1	+1·7	−0·7	−2·3						

The sign − denotes that the temperature of that month was below the average, and the sign + denotes that it was above the average.

In the following Table the mean temperature has been taken for the quarterly periods ending March 31, June 30, September 30 and December 31; and for the year, these numbers will be immediately comparable with those now published in the Registrar-General's Quarterly and Annual Reports.

Table IV.—Showing the mean temperature in quarterly periods, for the year, and the same for successive groups of years.

Year.	January, February, March.	Group of years.	April, May, June.	Group of years.	July, August, September.	Group of years.	October, November, December.	Group of years.	For the year.	Group of years.
	°	°	°	°	°	°	°	°	°	°
1774.	38·4	40·2	53·7	54·4	60·0	62·1	43·0	44·7	48·9	50·2
1775.	42·7		56·5		61·8		43·9		51·2	
1776.	38·2		53·2		60·5		46·1		49·5	
1777.	39·5		51·9		61·5		44·9		49·4	
1778.	38·2		55·4		62·3		45·8		50·5	
1779.	43·4		55·5		64·3		46·0		51·5	
1780.	39·1		58·0		63·8		43·4		50·1	
1781.	41·0		54·2							
1787.	41·0	39·9	52·2	52·3	60·1	60·0	43·9	43·9	49·3	49·1
1788.	39·6		55·8		59·9		40·9		49·1	
1789.	37·2		51·7		59·0		43·7		47·9	
1790.	42·3		51·1		58·8		44·8		49·3	
1791.	41·6		52·9		60·3		42·2		49·3	
1792.	39·5		52·0		59·8		45·3		49·2	
1793.	39·4		50·5		60·0		46·6		49·2	
1794.	42·1		53·6		60·6		44·1		50·1	
1795.	33·5		51·2		61·3		47·6		48·4	
1796.	42·6		52·3		60·3		40·4		48·9	
1797.	37·7	39·7	51·3	52·9	60·1	60·8	44·5	44·4	48·4	49·4
1798.	40·1		55·7		60·9		42·5		49·8	
1799.	37·0		49·9		58·3		42·3		46·9	
1800.	37·5		53·5		62·7		44·1		49·5	
1801.	42·1		53·5		61·7		43·7		50·2	
1802.	39·0		53·1		60·5		42·3		48·7	
1803.	39·7		52·4		60·5		46·0		49·4	
1804.	41·8		54·9		60·9		45·0		50·7	
1805.	39·7		50·8		61·1		43·6		48·9	
1806.	42·3		53·6		61·0		49·8		51·7	
1807.	39·2	39·1	53·4	52·2	61·2	59·9	44·1	44·3	49·6	48·9
1808.	38·2		53·3		62·3		43·3		49·3	
1809.	40·4		52·5		59·3		44·7		49·2	
1810.	39·8		52·8		61·4		45·7		49·9	
1811.	39·9		54·5		59·4		47·5		50·3	
1812.	40·0		49·9		57·9		42·8		47·7	
1813.	41·1		51·5		58·3		42·7		48·4	
1814.	33·3		51·1		59·3		44·4		47·0	
1815.	40·7		54·1		62·0		43·7		50·2	
1816.	38·9		49·4		58·2		43·9		47·6	

TABLE IV. (Continued.)

Year.	January, February, March.	Group of years.	April, May, June.	Group of years.	July, August, September.	Group of years.	October, November, December.	Group of years.	For the year.	Group of years.
	°	°	°	°	°	°	°	°	°	°
1817.	42·5	40·6	51·3	53·8	57·3	61·4	44·3	45·9	48·9	50·3
1818.	40·0		54·7		64·6		48·5		51·9	
1819.	42·7		54·0		62·3		43·1		50·5	
1820.	38·0		53·6		58·6		44·1		48·5	
1821.	40·1		55·6		60·8		48·7		50·5	
1822.	44·8		56·1		61·1		46·9		52·2	
1823.	37·9		52·0		59·2		44·8		48·7	
1824.	39·0		50·5		61·2		47·2		49·5	
1825.	39·7		54·8		63·4		45·5		50·8	
1826.	40·1		55·0		62·9		46·0		51·1	
1827.	37·4	40·2	53·4	54·2	60·9	60·1	47·1	45·8	49·7	50·1
1828.	42·5		54·6		60·6		47·6		51·3	
1829.	37·7		53·4		58·1		41·9		47·8	
1830.	38·3		53·8		59·3		44·7		49·0	
1831.	41·2		54·4		62·4		48·4		51·6	
1832.	39·6		53·7		60·7		47·1		50·3	
1833.	39·5		58·5		54·5		46·8		50·0	
1834.	44·2		53·7		62·7		46·5		51·8	
1835.	41·6		54·1		62·7		43·3		50·4	
1836.	40·6		52·7		59·5		44·1		49·3	
1837.	39·1	39·4	49·4	52·2	59·9	59·4	45·6	45·1	48·5	49·2
1838.	35·8		50·8		59·3		45·3		47·8	
1839.	39·8		50·9		59·4		45·7		48·9	
1840.	39·6		52·9		56·1		42·5		48·6	
1841.	40·2		54·2		59·6		45·7		49·8	
1842.	40·8		54·4		61·9		45·6		50·7	
1843.	40·8		52·6							

The mean temperature from all the observations

For the quarter ending March . 31 was 39°8,
„ June . . 30 was 53·1,
„ September 30 was 60·5,
„ December 31 was 44·8,

and for the year from all the observations was 49°·6.

By taking the difference between these numbers, and those contained in the preceding Table, the next Table is immediately formed.

Table V.—Showing the excess of the quarterly and yearly mean temperatures, in every year, above their means from all the years.

Year.	January, February, March.	April, May, June.	July, August, September.	October, November, December.	Whole year.	Year.	January, February, March.	April, May, June.	July, August, September.	October, November, December.	Whole year.
1774.	−1°·4	+0·6	−0°·5	−1°·8	−0°·7	1811.	+0°·1	+1°·4	−1°·1	+2°·7	+0°·7
1775.	+2·9	+3·4	+1·3	−0·9	+1·6	1812.	+0·2	−3·2	−2·6	−2·1	−1·9
1776.	−1·6	+0·1	0·0	+1·3	−0·1	1813.	+1·3	−1·6	−2·2	−2·1	−1·2
1777.	−0·3	−1·2	+1·0	+0·1	−0·2	1814.	−6·5	−2·0	−1·2	−0·4	−2·6
1778.	−1·6	+2·3	+1·8	+1·0	+0·9	1815.	+0·9	+1·0	+1·5	−1·1	+0·6
1779.	+3·6	+2·4	+3·8	+1·8	+1·9	1816.	−1·0	−3·7	−2·3	−0·9	−2·0
1780.	−0·7	+0·9	+3·3	−1·4	+0·5	1817.	+2·7	−1·8	−3·2	−0·5	−0·7
1781.	+1·2	+1·1				1818.	+0·2	+1·6	+4·1	+3·7	+2·3
						1819.	+2·9	+0·9	+1·8	−1·7	+0·9
1787.	+1·2	−0·9	−0·4	−0·9	−0·3	1820.	−1·8	+0·5	−1·9	−0·7	−1·1
1788.	−0·2	+2·7	−0·6	−3·9	−0·5	1821.	+0·3	+2·5	+0·3	+3·9	+0·9
1789.	−2·6	−1·4	−1·5	−1·1	−1·7	1822.	+5·0	+3·0	+0·6	+2·1	+2·6
1790.	+2·5	−2·0	−1·7	0·0	−0·3	1823.	−1·9	−1·1	−1·3	0·0	−0·9
1791.	+1·8	−0·2	−0·2	−2·6	−0·3	1824.	−0·8	−2·6	+3·7	+2·4	−0·1
1792.	−0·3	−1·1	−0·7	+0·5	−0·4	1825.	−0·1	+1·7	+2·9	+0·7	+1·2
1793.	−0·4	−2·6	−0·5	+1·8	−0·4	1826.	+0·3	+1·9	+2·4	+1·2	+1·5
1794.	+2·3	+0·5	+0·1	−0·7	+0·5	1827.	−2·4	+0·3	+0·4	+2·3	+0·1
1795.	−6·3	−1·9	+0·8	+2·8	−1·2	1828.	+2·7	+1·5	+0·1	+2·8	+1·7
1796.	+2·8	−0·8	−0·2	−4·4	−0·7	1829.	−2·1	+0·3	−2·4	−2·9	−1·8
1797.	−2·1	−1·8	−0·4	−0·3	−1·2	1830.	−1·5	+0·7	−1·2	−0·1	−0·6
1798.	+0·3	+2·6	+0·4	−2·3	+0·2	1831.	+1·4	+1·3	+1·9	+3·6	+2·0
1799.	−2·8	−3·2	−2·2	−2·5	−2·7	1832.	+0·2	+0·6	+0·2	+2·3	+0·7
1800.	−2·3	+0·4	+2·2	−0·7	−0·1	1833.	−0·3	+5·4	−6·0	+2·0	+0·4
1801.	+2·3	+0·4	+1·2	−1·1	+0·6	1834.	+4·4	+0·6	+2·2	+1·7	+2·2
1802.	−0·8	0·0	0·0	−2·5	−0·9	1835.	+1·8	+1·0	+2·2	−1·5	+0·8
1803.	−1·1	−0·7	0·0	+1·2	−0·2	1836.	+0·8	−0·4	−1·8	−0·7	−0·3
1804.	+2·0	+1·8	+0·4	+0·2	+1·1	1837.	−0·7	−3·7	−0·6	+0·8	−1·1
1805.	−0·1	−2·3	+0·6	−1·2	−0·7	1838.	−4·0	−2·3	−1·2	+0·5	−1·8
1806.	+2·5	+0·5	+0·5	+5·0	+2·1	1839.	0·0	−2·2	−1·1	+0·9	−0·7
1807.	−0·6	+0·3	+0·7	−0·7	0·0	1840.	−0·2	−0·2	−4·4	−2·3	−1·0
1808.	−1·6	+0·2	+1·8	−1·5	−0·3	1841.	+0·4	+1·1	−0·9	+0·9	+0·2
1809.	+0·6	−0·6	−1·2	−0·1	−0·4	1842.	+1·0	+1·3	+1·4	+0·8	+1·1
1810.	0·0	−0·3	+0·9	+0·9	+0·3	1843.	+1·0	−0·5			

The sign — denotes that the period was below the average, and the sign + denotes that the period was above the average.

The numbers in the last column of this table indicate the excess or defect of the temperature of that year above or below the average. The year of lowest temperature was 1799, and every month in this year was below its average value except November (see Table III.). The year of highest temperature was 1822, which by reference to Table III., was warm throughout, the months of September and December being those only whose temperatures were below their averages. The mean temperature of the year, therefore, within this period has varied from 46°·9 in 1799 to 52°·2 in 1822. The difference between these numbers is 5°·3. This amount of difference upon the whole year is very large.

The quarterly values of temperature, as found in the preceding tables, do not represent the mean value for any meteorological period; the latter values always follow the astronomical divisions of the year. In the following Table the year is supposed to begin in March, so that every year may consist of one summer and one entire winter, and not of parts of two winters with the summer intervening, therefore—

Spring includes the months of March, April and May;
Summer includes the months of June, July and August;
Autumn includes the months of September, October and November;
Winter includes the months of December, January and February;

so that winter consists of the last month of one civil year, and the first two months of the following year.

TABLE VI.—Showing the mean temperature in Spring, Summer, Autumn and Winter, and the same for successive groups of years.

Year.	Spring.		Summer.		Autumn.		Winter.	
	March, April, May.	Group of years.	June, July, August.	Group of years.	September, October, November.	Group of years.	December, January, February.	Group of years.
1774.	48°·0	49°·1	61°·7	63°·0	48°·8	50°·7	41°·3	38°·7
1775.	49·3		63·2		50·2		36·9	
1776.	48·3		61·8		50·8		38·1	
1777.	48·1		60·8		52·3		36·9	
1778.	48·4		65·0		49·3		42·4	
1779.	51·9		63·3		52·7		36·2	
1780.	50·7		63·7		50·8		39·2	
1781.	48·3		64·7					
1787.	47·3	46·9	61·2	60·1	48·7	49·9	40·0	38·9
1788.	49·2		60·7		49·7		35·6	
1789.	45·0		59·0		47·9		41·9	
1790.	46·7		59·6		49·7		40·7	
1791.	47·8		60·5		49·5		37·2	
1792.	46·3		59·4		50·3		39·8	
1793.	45·2		60·8		50·4		41·1	
1794.	49·2		61·8		49·6		33·1	
1795.	46·3		58·8		52·9		44·7	
1796.	45·9		59·3		49·8		35·3	
1797.	45·7	47·3	60·1	60·9	48·9	50·3	40·0	39·5
1798.	48·9		62·3		50·0		38·6	
1799.	43·8		58·7		49·4		36·1	
1800.	47·7		61·7		50·5		40·2	
1801.	48·8		61·5		51·1		37·4	
1802.	47·7		60·7		48·5		37·3	
1803.	47·8		61·6		49·1		42·6	
1804.	48·2		61·5		52·7		37·7	
1805.	46·7		59·5		50·1		42·0	
1806.	47·3		61·8		53·1		42·6	
1807.	46·0	46·6	62·6	59·4	47·6	50·4	38·1	38·6
1808.	46·7		63·1		49·6		38·3	
1809.	47·5		59·7		49·6		39·4	
1810.	47·2		57·3		52·6		38·5	
1811.	49·8		59·3		53·6		40·1	
1812.	44·8		57·2		49·6		38·5	
1813.	44·2		58·5		49·2		33·9	
1814.	45·0		58·7		48·8		39·5	
1815.	50·2		60·5		52·1		38·2	
1816.	44·9		56·2		50·9		41·3	

TABLE VI. (Continued.)

Year.	Spring.		Summer.		Autumn.		Winter.	
	March, April, May.	Group of years.	June, July, August.	Group of years.	September, October, November.	Group of years.	December, January, February.	Group of years.
	°	°	°	°	°	°	°	°
1817.	44·5	47·9	58·4	61·4	50·3	51·7	38·9	40·4
1818.	47·4		65·3		55·7		41·1	
1819.	49·9		61·7		50·0		36·7	
1820.	48·6		59·1		48·8		39·3	
1821.	48·6		58·9		53·7		43·9	
1822.	51·0		63·2		53·3		36·9	
1823.	46·8		59·2		49·9		39·3	
1824.	45·3		60·2		52·5		40·9	
1825.	48·0		63·0		51·0		39·7	
1826.	48·5		65·0		50·8		37·1	
1827.	48·6	48·4	61·1	61·6	51·6	50·8	42·8	40·1
1828.	49·2		61·4		51·8		39·6	
1829.	46·8		60·0		47·9		34·7	
1830.	50·7		59·9		50·8		38·3	
1831.	49·3		63·4		53·1		40·2	
1832.	47·5		61·5		51·7		41·2	
1833.	48·5		59·8		49·7		44·5	
1834.	48·1		63·5		52·2		41·5	
1835.	47·9		63·6		50·6		37·8	
1836.	47·7		61·3		48·6		40·5	
1837.	42·1	46·8	60·9	60·7	50·1	49·7	35·8	38·7
1838.	45·7		60·2		50·5		39·8	
1839.	44·4		60·3		50·9		40·3	
1840.	47·4		59·4		49·3		35·8	
1841.	51·1		59·2		51·2		39·6	
1842.	48·5		64·1		46·3		41·3	
1843.	48·3							

The mean temperature for Spring from all the observations was	47°·6
The mean temperature for Summer from all the observations was . . .	61·0
The mean temperature for Autumn from all the observations was . . .	50·5
The mean temperature for Winter from all the observations was . . .	39·3
The mean temperature for the Year from all the observations was . . .	49·6

By taking the difference between the mean temperature of each period from all the observations, and the mean temperature for the same period in every year, the following Table was formed.

TABLE VII.—Showing the excess of the mean temperature in Spring, Summer, Autumn and Winter, in every year, above the mean temperature for the period.

Year.	Spring.	Summer.	Autumn.	Winter.	Year.	Spring.	Summer.	Autumn.	Winter.
1774.	+0°·4	+0°·7	−1°·7	−2°·0	1811.	+2°·2	−1°·7	+3°·1	+0°·8
1775.	+1·7	+1·2	−0·3	−2·4	1812.	−2·8	−3·8	−0·9	−0·8
1776.	+0·7	+0·8	+0·3	−1·2	1813.	−3·4	−2·5	−1·3	−5·4
1777.	+0·5	−0·2	+1·8	−2·4	1814.	−2·6	−2·3	−1·7	+0·2
1778.	+0·8	+4·0	−1·3	+3·1	1815.	+2·6	−0·5	+1·6	−1·1
1779.	+4·3	+2·3	+2·2	−3·1	1816.	−2·7	−4·8	+0·4	+2·0
1780.	+3·1	+2·7	+0·3	−0·1	1817.	−3·1	−2·6	−0·2	−0·4
1781.	+0·7	+3·7			1818.	−0·2	+4·3	+5·2	+1·8
					1819.	+2·3	+0·7	−0·5	−2·6
1787.	−0·3	+0·2	−1·8	+0·7	1820.	+1·0	−1·9	−1·7	0·0
1788.	+1·6	−0·3	−0·8	−3·7	1821.	+1·0	−2·1	+3·2	+4·6
1789.	−2·6	−2·0	−2·6	+2·6	1822.	+3·4	+2·2	+2·8	−2·4
1790.	+0·9	−1·4	−0·8	+1·4	1823.	−0·8	−1·8	−0·6	0·0
1791.	+0·2	−0·5	−1·0	−2·1	1824.	−2·3	−0·8	+2·0	+1·6
1792.	−1·3	−1·6	−0·2	+0·5	1825.	+0·4	+2·0	+1·5	+0·4
1793.	−2·4	−0·2	−0·1	+1·8	1826.	+0·9	+4·0	+0·3	−2·2
1794.	+1·6	+0·8	−0·9	−6·2	1827.	+1·0	+0·1	+1·1	+3·5
1795.	−1·3	−2·2	+2·4	+5·4	1828.	+1·6	+0·4	+1·3	+0·3
1796.	−1·7	−1·7	−0·7	−4·0	1829.	−0·8	−1·0	−2·6	−4·6
1797.	−1·9	−0·9	−1·6	+0·7	1830.	+3·1	−1·1	+0·3	−1·0
1798.	+1·3	+1·5	−0·5	−0·7	1831.	+1·7	+2·4	+2·6	+0·9
1799.	−3·8	−2·3	−1·1	−3·2	1832.	−0·1	+0·5	+1·2	+1·9
1800.	+0·1	+0·7	0·0	+0·9	1833.	+0·9	−1·2	−0·8	+5·2
1801.	+1·2	+0·5	+0·6	−1·9	1834.	+0·5	+2·5	+1·7	+2·2
1802.	+0·1	−0·3	−2·0	0·0	1835.	+0·3	+2·6	+0·1	−1·5
1803.	+0·2	+0·6	−1·4	+3·3	1836.	+0·1	+0·3	−1·9	+1·2
1804.	+0·6	+0·5	+2·2	−1·6	1837.	−5·5	−0·1	−0·4	−3·5
1805.	−0·9	−1·5	−0·4	+2·7	1838.	−1·9	−0·8	0·0	+0·5
1806.	−0·3	+0·8	+2·6	+3·3	1839.	−3·2	−0·7	+0·4	+1·0
1807.	−1·6	+1·6	−2·9	−1·2	1840.	−0·2	−1·6	−1·2	−3·5
1808.	−0·9	+2·1	−0·9	−1·0	1841.	+3·5	−1·8	+0·7	+0·3
1809.	−0·1	−1·3	−0·9	+0·1	1842.	+0·9	+3·1	−4·2	+2·0
1810.	−0·4	−3·7	+2·1	−0·8	1843.	+0·7			

The sign − denotes that the mean temperature for that period was below the average, and the sign + denotes that it was above the average.

It will be seen that hitherto the mean temperature at Somerset House has been estimated a great deal too high; in almost every case the corrections have reduced the temperature. I have not in this paper discussed the question whether the temperature, as now determined, is too high for the latitude and elevation of Somerset House. This discussion will be necessary when I attempt to connect the series at Greenwich (which I look upon as merely a continuation of that taken at the Royal Society) with these results. I have already made some progress in this investigation, and hope in a short time to present to the Society the results of my labours, and to give similar results to those in this paper brought up to the present time. At some future time I hope to be able to reduce the barometrical observations in a similar manner, the results from which will be of great value; for although there has been neglect in stating at different times, what corrections have, and what have not been applied, yet I think they admit of the deduction of valuable results.